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Endodontic treatment of extra oral cutaneous sinus tract - case series

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Abstract

Dental infection can be a serious complication if the infection spreads to the fascial spaces leading to life threatening complications.

Many pathologies superficially appear similar to a draining extra oral sinus tract of dental origin. An incorrect diagnosis usually leads to multiple inappropriate treatments thus prolonging the appropriate treatment. Routine dental radiographs are insufficient as a diagnostic tool; therefore, in a suspected case of dental sinus, apical radiographs and appropriate referrals should be ordered. In this way, every effort is made to save the patient from unnecessary treatment or surgery. This article includes two case reports which were misdiagnosed as medical origin and finally root canal treated which showed complete resolution of the symptoms and revealed apparent healing owing to the dental origin of a cutaneous extra oral sinus tract.

Keywords: Oral cutaneous sinus tract, extra oral sinus tract, fascial planes, submental, pus discharge, swelling, dysphagia, scar, PAI.

Introduction

An odontogenic cutaneous sinus tract (OCST) is a pathological communication between the epidermal surface of the face and the oral cavity. It often resembles a recurrent or chronic cyst, a furuncle, or an ulcer or sunken skin lesion[7]

The differential diagnosis of an oral cutaneous sinus tract includes a wide range of nonodontogenic pathologies, such as dermal infection, osteomyelitis, tuberculosis, actinomycosis, salivary gland parulis, deep fungal infections, foreign body reactions, congenital fistulas and pyogenic granuloma. these pathologies may

have an appearance that is superficially similar to a draining OCST of dental origin but they are Not a True Sinus Tract [2,6.] An incorrect diagnosis usually leads to multiple inappropriate treatments by a Pphysician, Ddermatologist, or Ggeneral surgeon (e.g., surgical excision, biopsy, radiotherapy, systemic or topical antibiotic or steroid regimens) resulting in temporary amelioration of symptoms[3,6].

Misdiagnosis leads to delayed treatment of odontogenic pathologyy and often makes the lesion chronic in nature and has major effects on aesthetics, because the underlying primary dental aetiology has not been correctly diagnosed[9] resulting in further skin scarring[7].

Appropriate treatment of odontogenic cutaneous sinus tracts for a restorable tooth is by elimination of source of infection by cconventional root canal treatment or apical surgery and for non-restorable tooth by extraction along with thorough excision of sinus tract lining[2].

This case series details 2 cases of extraoral sinus of odontogenic origin diagnosed precisely and treated by nonsurgical endodontic therapy. both the cases resulted in complete resolution of the lesion abetting the Esthetic concerns of the patient.

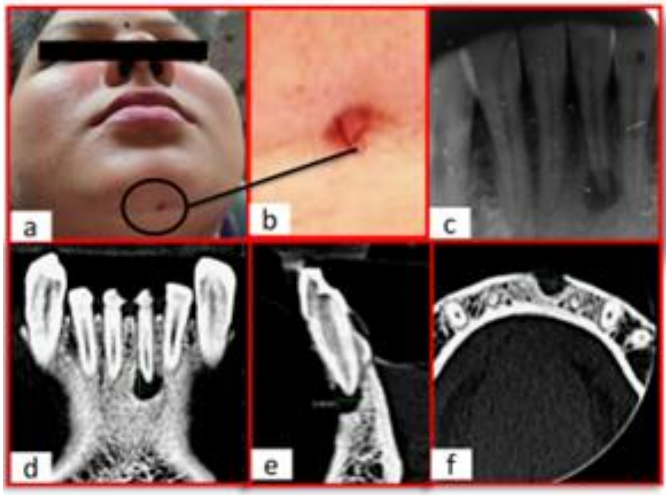
Case report 1

A 31-year-old female patient reported with a chief complaint of swelling in the chin with recurrent pus discharge for the past 1 year. She gave a history of trauma due to self-fall 21 years back in the same region. Her past medical history revealed that she was treated for the same by surgical curettage twice 15 years and 10 years back by a General Surgeon. However, she had recurrence of swelling with pus discharge multiple times after both the surgeries.

Extraoral examination revealed an erythematous, smooth, slightly stiff nodule with crusting and tenderness which is about 5mm in diameter in the submental region. Skin around nodule was hyperpigmented with retraction of skin below normal surface. On palpation no pus discharge and lymph node involvement was present. Intraoral examination revealed a mildly discoloured 31 which was tender on percussion with grade I mobility and negative response on neurosensibility testing. On Radiographic examination a well-defined periapical radiolucency involving apical third of the root of 31 with Periapical Index Grading (PAI) 4 was seen. On CBCT examination a well-defined radiolucency of dimension 4.8 x 4.3 x 3.7 mm with complete loss of buccal cortical plate in relation to 31, CBCT Periapical index grading (CBCT-PAI) was 4+D.

Diagnosis was Chronic Suppurative Periapical Periodontitis with an Extraoral Sinus in relation to tooth 31. Non-surgical endodontic therapy was decided as initial treatment plan. (Fig.1)

Fig 1: Pre operative: a,b) Extraoral sinus, c) Periapical radiolucency in relation to 31 in IOPA, d) in CBCT, e) Loss of buccal cortical plate in CBCT - sagittal plane, f) in axial plane.

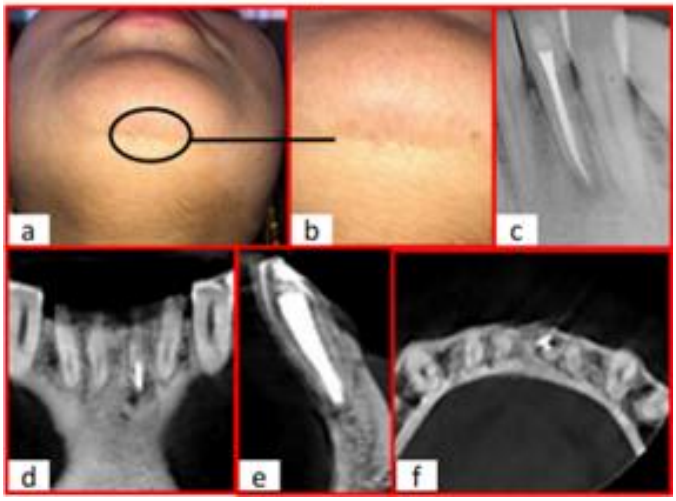


On her first appointment under rubber dam isolation access cavity was prepared; following apical patency establishment, pus was drained from the canal. The working length was determined radiographically. Cleaning and shaping was performed using k-file (Mani, Japan) and step-back technique using 0.9% normal Saline (Denis Chem Lab Limited, India) and 1.5%

sodium hypo chloride (Prime, Maharashtra, India) as irrigants. Calcium hydroxide (Prime, Maharashtra, India) mixed with 2% chlorhexidine (Ana bond Asep-RC, Tamilnadu, India) was placed as intracanal medicament and the patient was recalled after 14 days.

On her second appointment, ppatient was asymptomatic, sinus opening had closed and the crusted nodule had fallen off. Intracanal medicament was repeated. On her third appointment, sinus tract mark was showing signs of healing. Obturation was done using cold lateral condensation technique using 2% GP (Meta biomed, Chungcheongbuk - do, Korea) and Bioceramic root canal sealer (Bio root RCS, Sseptodont). 6 months follow-up showed ongoing healing of periapical radiolucency with minimal scarring of cutaneous lesion. 1year follow-up showed cutaneous lesion had completely healed with no scarring. Hhyperpigmentation of skin around the sinus and retraction of skin below the cutaneous lesion had returned to normal. Radiographic evaluation of periapical radiolucency showed complete resolution. CBCT evaluation showed resolution of radiolucency with noticeable formation of buccal cortical plate with decrease in size of lesion to 1.1 x1.2 x1.4 mm. (Fig.2)

Fig 2: After 1 year - Post operative : a,b) Healed site, c) Resolution of the periapical radiolucency in relation to 31 in IOPA, d) in CBCT, e) Formation of buccal cortical plate in CBCT-sagittal plane, f) in axial plane.

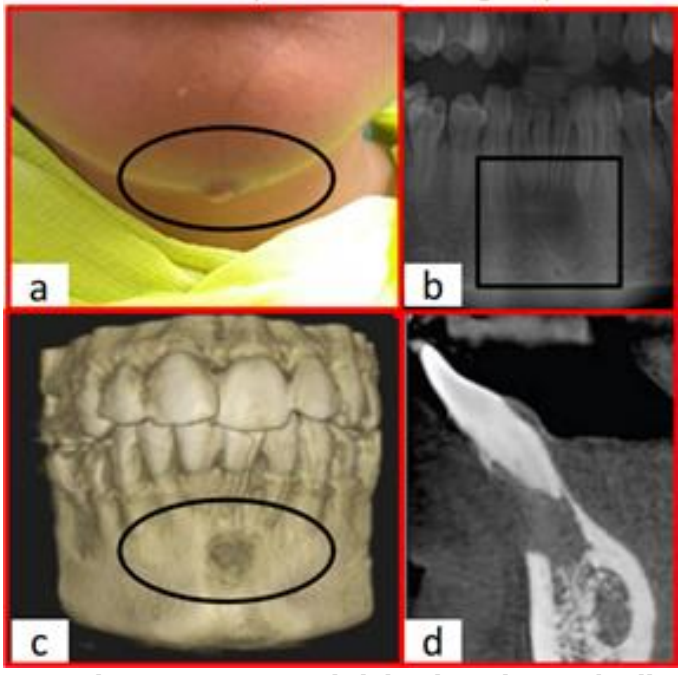


Case report 2

A 23-year-old female patient reported with a chief complaint of dysphagia, pain and swelling in the lower jaw with pus discharge in the chin region. She gave a history of trauma to her chin 13 years back with history of similar symptomatic episodes multiple times in the past 13 years.

Extraoral examination revealed ill-defined diffuse swelling extending bilaterally, anteriorly from symphysis menti, posteriorly till the angle of the mandible and inferiorly till the hyoid bone. Sinus opening was evident in the submental region at the inferior border of the mandible with spontaneous pus discharge. On palpation, the swelling was warm, tender, fluctuant with tingling sensation in the submental region.

Fig 3: Pre operative: a) Extraoral sinus, b) Periapical radiolucency in relation to 31, c) Loss of bone structure in relation to 31, d) Loss of buccal cortical plate in CBCT- sagittal plane



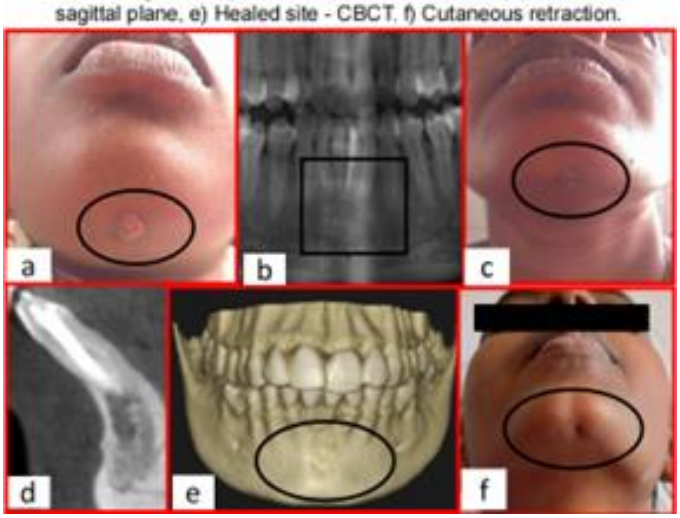
Intraoral examination revealed disc loured 31 with Ellis Class II fracture which was tender on percussion and negative response on neurosensibility testing. Swelling completely obliterated the lower labial vestibule which was tender and fluctuant on palpation. Impression of

OPG reveals an ill-defined periapical radiolucency in relation to apical third of the root of 31 with Periapical Index (PAI) score of 5. On CBCT examination a well-defined radiolucency of dimension 4.2 x 4.2 x 4 mm with complete loss of buccal cortical plate in relation to 31. CBCT Periapical index grading (CBCT-PAI) was 4+D. Diagnosis was Chronic Suppurative Periapical Periodontitis with space infection in the submental and submandibular region with an Extraoral Sinus in the submental region in relation to tooth 31. The treatment plan was to perform non-surgical endodontic therapy in 31. (Fig.3)

On the first appointment under rubber dam isolation access cavity was prepared; following apical patency establishment pus drained from canal. Open dressing was given and the patient was prescribed antibiotics and analgesics. On second appointment after 2 days, reduction in swelling size was evident, patient was asymptomatic and dysphagia was relieved. Canal was dry with no pus discharge. Working length was determined radiographically. Cleaning and shaping was performed using k-file (Mani, Japan) and step-back technique using 0.9% normal Saline (Denis Chem Lab Limited, India) and 1.5% sodium hypo chloride (Prime, Maharashtra, India) as irrigants. Calcium hydroxide (Prime, Maharashtra, India) mixed with 2% chlorhexidine (Ana bond Asep-RC, Tamilnadu, India) was placed as an intracanal medicament. The patient recalled after 14 days.

On the third appointment, patient was asymptomatic and the swelling completely reduced. Clinically sinus tract mark showed signs of healing. Obturation was done with cold lateral condensation method using 2% gutta percha (Meta biomed, chungcheongbuk-do, Korea) and Bioceramic root canal sealer (Bio root RCS, Septodont). Follow up at 6 months, 1 and 3 years revealed that the patient has become asymptomatic and sinus opening had healed with reduction of hyperpigmentation but with slight retraction of the skin. Radiographic evaluation of periapical radiolucency showed complete resolution, CBCT evaluation showed resolution of radiolucency with noticeable formation of buccal cortical plate with decrease in lesion dimension to 1 x 0.9 x 1.5 mm. (Fig.4)

Fig 4: Post operative: After 3 days - a) Healing site, b) Healing periapical radiolucency in relation to 31 ; **After 1 year** - c) Healing site; **After 3 years** - d) Formation of buccal cortical plate in CBCT - sagittal plane, e) Healed site - CBCT, f) Cutaneous retraction.



Discussion

Following the path of least resistance the inflammation spreads from necrotic pulp the surrounding periodontium resulting in apical periodontitis. This combined inflammatory process and immunological mediators induce bone resorption. When the marrow spaces are involved, suppurative osteitis i.e., a localized abscess is formed. Iinflammation then spreads peripherally until bone cortex is destroyed and forms subperiosteal abscess. After the destruction of periosteum, either a cutaneous sinus or an intraoral sinus develops depending on various factors such as gravity, microbial virulence and aarrangement of muscles and fascia. Infection ranges from mild well localized low-grade infection to severe life-threatening space infection such as Ludwig's Angina[3].

The prevalence of intraoral sinus tract ranges from 8.5%–18.1% in teeth with apical periodontitis, whereas an OCST of odontogenic origin is relatively uncommon[1,2,3,6.] OCSTs are likely to occur if the tooth apex is above the maxillary muscle attachments or below the mandibular muscle attachments. Mandibular teeth are most frequently associated with OCSTs in 80%-87%[6,8]. A periapical infection with an associated OCST manifests as varying magnitudes of discomfort before ST development rather than pain[8]. Chronic pus drainage through the sinus tract prevents build-up of pressure and thus most of the patients are asymptomatic.

Only 50% of these patients experience pain but the involved teeth are not tender to percussion in most cases [3,8]. The lack of specific intraoral symptoms and an unesthetic appearance over the skin might be the reason that patients usually do not relate the skin lesion to a dental origin and first seek help from physicians, instead of dentists.

Pproduction of a purulent discharge during palpation confirms the presence of a sinus tract[9]. In addition, finding any discharging cutaneous lesion on the face or neck calls for an intraoral examination, which may lead to discovery of one or more grossly decayed teeth or a tooth with an intact crown[9].

CBCT images confirms the odontogenic origin of sinus tract by showing periapical radiolucency with cortical plate perforation in relation to the lesion. It can even reveal the periapical radiolucencies that are not visible upon conventional radiography[4]. It is an effective assistant diagnostic tool for the confirmation of odontogenic etiology. Thus, in this case series, verification of the odontogenic origin of the extraoral lesion is confirmed by the combination of clinical and radiologic examination, including CBCT imaging avoiding the stressful and invasive mapping procedure[4].

According to Thoma KH et al and Harrison JW et al, the cyst might be lined by epithelium and a surgical intervention apart from endodontic treatment is necessary. But, later Grossman et al, suggested that it was lined by granulation tissue & not epithelium which directed to the non-surgical endodontic treatment option in both intra-oral and extra oral sinus cases. Non-surgical endodontic treatment is less expensive, very well accepted by patients and show lower flare-up rate[5]. Biomechanical preparation along with irrigation alone decreases the bacterial count in the canal by 1000-fold due to space constraint and loss of nutrition after effective obturation[5].

Addition of 2% Cchlorhexidine to Calcium hydroxide as an intracanal medicament maintains the antibacterial activity for a prolonged period of time due to preservation of high alkalinity which is beneficial in persistent primary infections and in retreatment cases. The time duration of Ca $(OH)_2$+CHX can affect its effectiveness, The optimum time rrecommended should be 2 weeks in close contact with periapical area. In both the cases, following 2 weeks of Ca $(OH)_2$ + CHX placement extraoral sinus opening closed, following 4 weeks mild changes in periphery of periapical lesion was visible in radiographs suggestive of healing. Bioceramic sealers are bioactive materials which act by stimulating bone physiological process and mineralization of the dentinal structure.

It is highly biocompatible with osteoinductive, osteoconductive, anti - inflammatory and tissue regeneration property creating a favourable environment for periapical healing.

As per earlier studies, on removal of the primary cause, the cutaneous lesion heals spontaneously without any treatment within 5 to 14 days[10]. Cutaneous retraction or dimpling may be visible because of the fixation of

underlying tissues through a sinus tract and may be a late finding in active disease or secondary to the healing process. Hyperpigmentation might occur which fades over time[6]. If a sinus tract does not close after treatment, further evaluation, including biopsy and microbiological sampling, may be required. In both the cases, healing occurred after the treatment, so no microbiological sampling and biopsy was done. If the healing results in cutaneous retraction or dimpling, cosmetic surgical treatment may be required at a later date [8]. But in this case series, though healing resulted in cutaneous retraction, the result is cosmetically tolerated.

Conclusion

These cases highlight the importance of intra-oral examination in patients with extra oral non-healing cutaneous lesions. Identifying the true nature and etiology of the lesion facilitates prompt treatment at the right time and also minimizes patient discomfort, Esthetic problems, and reduces the possibility of further complications greatly.

References

1. Bender IB, Seltzer S. The oral fistula: its diagnosis and treatment. Oral Surg Oral Med Oral Pathol 1961; 14:1367–76.

2. Chan CP, Chang SH, Huang CC, et al. Cutaneous sinus tract caused by vertical root ffracture. J Endod 1997; 23:593–5.

3. Cohenca N, Karni S, Rotstein I. Extra oral sinus tract misdiagnosed as an endodontic lesion. J Endod 2003; 29(12):841-3.

4. Estrela C, Bueno MR, Leles CR, et al. Accuracy of cone beam computed tomography and panoramic and periapical radiography for detection of apical periodontitis. J Endod 2008; 34:273–9.

5. Nakamura Y, Hirayama K, Hossain M, Matsumoto K. A case of an odontogenic cutaneous sinus tract. Int Endod J 1999; 32:328–31.

6. Orstavik D, Qvist V, Stoltze K. A multivariate analysis of the outcome of endodontic treatment. Eur J Oral Sci 2004;112(3):224-230.

7. Saifeldeen K. Ludwig's angina. Emerg Med J 2004;21(2):242—3.

8. Slutzky-Goldberg I, Tsesis I, Slutzky H, Heling I. Odontogenic sinus tracts: a cohort study. Quintessence Int 2009; 40:13–8.

9. Tian J, Liang G, Qi W, Jiang H. Odontogenic cutaneous sinus tract associated with a mandibular second molar having a rare distolingual root: a case report. Head Face Med 2015; 11: 13.

10. Witherow H, Wash an P, Blenkinsopp P (2003) Midline odontogenic infections: a continuing diagnostic problem. British Journal of Plastic Surgery 56, 173–5.